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Folding Box with Fold-Down Attachment Flap

DESCRIPTION

The invention relates to a sealable folding box in the shape of a parallelepiped or cube with attached bottom and cover flaps and an attachment flap – provided with an attachment recess – that is arranged on an edge of the folding box body that extends between these flaps.

Such a folding box is known. The firm Berlex' Laboratories, Wayne, NJ 07470 produces the imprint "YASMIN® 28 tablets, Patient Starter Pack" in a parallelepiped-shaped design. On one of the two large-area side walls of this folding box, an attachment flap is arranged as a side-wall extension. The attachment flaps and the side walls are of the same length. An adhesive flap that is almost identical to the attachment flap is arranged on the small side wall that orthogonally abuts this side wall in the area of the attachment flap. The adhesive flap is folded outward in production to be able to be glued over the entire surface to the attachment flap. This has the result that when the folding box is assembled, the attachment flap rigidly projects over the latter. As a result, the folding box is bulky when being handled at the filling plant and later in commercial use. In addition, leaks are produced along the folding zone located there by the outside folding of the adhesive flap. Finally, a perforation or a number of slotted punch-outs are required

in the folding zone for the outside folding as a substitute for grooving on the back side that would otherwise be necessary. The perforation or the punch-outs and the grooves that are necessary for the folds are all incorporated from the printing side into the matrix.

This invention therefore is based on the formulation of the problem of developing a folding box that allows simple and reliable handling in production, storage and filling, that encloses the contents largely dust-tight and that can be marketed stacked or suspended.

The problem is solved with the features of the main claim. To this end, in addition to four side walls, the folding-box body – in the lengthwise direction of the matrix – has a sealing flap on one end and a combination section on the other end, whereby after the folding box is formed, the sealing flap comes to rest inside on the side wall, which when the matrix of the folding box is extended, is the furthest from it, while in certain areas, the combination section is attached on the outside flat against the side wall, which, when the matrix of the folding box is extended, is the furthest from it. The combination section consists of an inside area and two outside areas, whereby the inside area is an attachment flap – provided with an attachment recess – while the outside areas are used to attach the combination section to the side wall with which it is in contact. The outside area is connected to the inside area via a separating structure.

With the subject according to the invention, a folding box with a fold-down attachment flap that is easy to produce is created, in which the attachment flap is part of a combination section. This combination section securely closes the folding box, e.g., by adhesion with an adjacent box side wall. When the attachment flap is pulled off and

folded down, the contents of the folding box in addition remain inaccessible and dust-free.

Since the attachment flap is folded down only once – if at all -- in commercial use, the folding box can be handled easily during filling.

Other details of the invention emerge from the subclaims that are not cited or that are only partially cited and the subsequent description of an embodiment that is depicted diagrammatically:

Figure 1: Folding box, closed with an attachment flap that is not integral with the box;

Figure 2: Folding box, assembled and open with an attachment flap attached;

Figure 3: Matrix of the folding box, extended;

Figure 4: Folding direction of the individual matrix sections, viewed from the front;

Figure 5: **Folding box blank** formed in a square tube, viewed from the front;

Figure 6: **Folding box blank** folded together for stacking, viewed from the front.

Figure 1 shows a closed folding box (10) in the shape of a parallelepiped with an attachment flap (51) that is not integral with the box. Folding box (10) has four side walls (11, 15, 21, 25), of which two each are arranged parallel to one another. Side walls (11, 15, 21, 25) form a type of square tube, cf. Figure 5, which is sealed on both sides by flaps (31, 35) that are attached to side wall (21).

Figure 3 depicts folding box (10) being laid out flat as a matrix (1). After this, folding box (10) consists of a single, **one-part** cardboard **blank**, whose fibers are

preferably oriented in lengthwise direction (2) of matrix (1). The cardboard has, for example, a specific weight of about 250 g/m^2. It is printed at least in certain areas and coated with a transparent paint. Side walls (11, 15, 21, 25) are central components of folding box (10) that are arranged behind one another from the left to the right. Rectangular side walls (11, 15, 21, 25) that are adjacent to one another are delimited from one another by corresponding parallel grooves (71-73). The area of grooves (71-73) or the material that directly surrounds the latter forms the lengthwise edges of the box in finished folding box (10). All grooves that are incorporated in the cardboard of matrix (1) are located on the smooth top side of the cardboard.

On large side wall (21), bottom flap (31) and cover flap (35) are arranged in the area of the short side edges or grooves (75, 76). Both flaps (31, 35) end in inserts (32, 36). Relative to flaps (31, 35), inserts (32, 36) are delimited in turn in each case by a groove (33, 37). On the two-sided ends of grooves (33, 37) are located angular punch-outs (34, 38) that prevent flaps (31, 35) from penetrating inside folding box (10) when folding box (10) is closed by attaching to short side edges (77, 78).

According to Figure 3, cover flap (35) has a field with a cross-hatched border. In this area, the cardboard is unpainted to be able to print variable data on it – if necessary, e.g., after the filling.

On small side walls (15) and (25) that are placed on both sides in addition to large side wall (21), in each case, e.g., seven-edged side flaps (16, 17; 26, 27) close upward and downward according to Figure 3. Also here, e.g., grooves (81-84) form a limit between side flaps (16, 17; 26, 27) and side walls (15, 25). With the aid of the latter, the small side edges of finished, closed folding box (10) are formed.

In the embodiment according to Figure 3, a so-called sealing flap (40) is arranged on the left outside edge of large side wall (11), which is depicted by a groove (45). Sealing flap (40), which, after folding box (10) is formed, comes to rest inside on small side wall (25) here, is somewhat smaller in area in lengthwise direction (2) and crosswise direction than side wall (25) with which it is in contact. In lengthwise direction, e.g., it is about 15% shorter, while in crosswise direction, for example, it is about 10% more narrow. Sealing flap (40) has two side edges (43, 44) that are, for example, shifted to the rear in parallel relative to short side edges (77, 78).

On the other end of matrix (1) is found, for example, three-part combination section (50), which is connected via a groove (57) or snap-off structure to integrated slotted punch-outs (58) in certain sections. Here, combination section (50) comprises two outside sections (61, 65) and one inside section (51). These sections (51, 61, 65) are delimited from one another by separating structures (55, 56). Separating structures (55, 56) run between groove (57) and free outside edge (54) of middle or inside section (51), for example parallel to lengthwise direction (2) of matrix (1). They are optionally oriented obliquely such that their imaginary extension lines, according to Figure 3, cut to the right outside of outside edge (54).

Slotted punch-outs (58) are located only between separating structures (55, 56). The width of inside section (51) is – measured crosswise to lengthwise direction (2) – about 73% of the total width of combination section (50) in the area of snap-off structure (57). The width of this section (51) should not exceed 75% of the total width of combination section (50).

Outside edge (54) is designed curved outward only by way of example. It can have almost any shape. This also applies for adjacent outside edges (63) and (67) of outside sections (61, 65), which are curved at an angle according to Figure 3 or in an arc according to Figures 1 and 2. The curves of outside edges (63, 67) encompass, e.g., an angle of 120°C. Two recesses, whose tips in each case end before one of separating structures (55, 56), are created by the arch of outside edge (54) and the curves of edges (63, 67). According to Figure 3, the recesses have, for example, an opening angle of 90 to 100°. Separating structures (55, 56) here are perforations, thus hole or slotted punch-outs, which make possible or facilitate a separation of inside section (51) from two outside sections (61, 65).

Two outside sections (61) and (65) can alternately be connected to one another via a connecting bridge (91). This connecting bridge (91) has an outside edge (92) that is depicted in dots and dashes in Figure 3 and a perforation (93) as a boundary to attachment flap (51). Connecting bridge (91) is optionally also bonded to side wall (21).

Outside edge (92) can reach up to long side chain (71).

The length of combination section (50) – viewed in lengthwise direction(2) of extended matrix (1) – can take up any length relative to closest side wall (25) or relative to next side wall (21) but one.

Punched, grooved, printed and painted matrix (1) is formed, as depicted in Figure 4, into a square tube by bending at grooves (57, 73, 72, 71, 45), cf. Figure 5. The lateral flexures – illustrated by arrows in Figure 4 – are always produced in one direction, here, e.g., counterclockwise. The expansion phases of the individual lateral flexures are always in the painted outside surface of folding box (10). Having bends or folds that run

in the same direction can make it unnecessary to have a perforation or slot or hole punch-out that runs through the cardboard.

To be able to better store and warehouse the folding boxes before they are filled, they are folded together in a compact manner by a shearing action around the grooves or side edges (71) and (73). Side walls (15) and (11) now rest on side walls (21) and (25). Three layers of cardboard thus lie almost flat over one another. For example, lower layers (50, 51) and (25), middle layers (11) and (40) and upper layers (15) and (21) form.

To fill folding box (10), matrix (1) that is bonded to the square tube is moved flat from a warehouse to the filling area. In flat folding box (10), side walls (21) and (25) here lie directly on the filling area. Long side chain (73) is in transport direction at the front, while side chain (72) is at the back, cf. Figure 2.

In the filling area, flat folding box (10) is directed to the square tube. Bottom flap (31), cover flap (35) and side flaps (17, 27; 16, 26) are open in the extensions of the side walls that they carry.

In front-side filling, for example via cover flap (31), a holding slide is moved into the inside of the box via the opening of bottom flap (35). In the opposite direction, the contents, e.g., a stack of at least one filled tablet blister, a package insert, a brochure and a weekday label, is pushed against the holding slide by means of a transport slide. After the stack is placed on the holding slide, the contents are placed in the middle in the assembled folding box. As soon as the slides retract from the folding box area, the folding box is sealed by closing flaps (31) and (35). Flaps (32) and (36) are bent during closing by more than a 90-degree angle. When folding box (10) is closed, the flaps adjoin side wall (21).

The thus finished and filled folding box (10) can be stacked in this form on shelves, in compartments or in drawers in a compact manner, such that the box is shaped like a parallelepiped – with the attachment flap that is securely attached during production.

For presentation on hanging shelves, attachment flap (51) is separated along separating structures (55, 56) and optionally (93) from areas (61, 65) that are bonded to folding box (10) and from side wall (11) on which it previously rested, depending on production, folded down by about an angle of 180 degrees. The fold-down movement is carried out by fold-down structure (58). With attachment recess (53), it is pushed open on the corresponding attachment profile of the hanging shelf.

If necessary, fold-down attachment flap (51) – e.g., housing with end users – can be folded back again on side wall (11). In this case, tear-off sites of tear-off structures (55, 56) and optionally (93) of areas (51; 61, 65) that are now adjacent again interlock. Punch-outs (58) of forward-folding structure (57) are sized such that the weakening of the cardboard is sufficient to avoid a renewed, unintentional recovery of the attachment section (51) that is attached. Attachment section (51) optionally can also be torn off by the end user without folding box (10) losing its dust seal depending on construction.

LEGEND

1	**Folding box blank** matrix, extended
2	Fiber direction, lengthwise direction
3	Transport direction
10	Folding box
11	Side wall, large
15	Side wall, small, middle
16, 17	Side flaps
21	Side wall, large, middle
25	Side wall, small
26, 27	Side flaps
31	Bottom flap
32	Bottom flap, insert
33	Groove between (31) and (32)
34	Punch-out, angular
35	Cover flap
36	Cover flap, insert
37	Groove between (35) and (36)
38	Punch-out, angular

40 Sealing flap

41 Lengthwise edge, free

43, 44 Side edges

45 Lengthwise edge, inside

50 Combination section

51 Inside or middle section or area, attachment flap

52 Contour, arc-shaped

53 Attachment recess, Euro hole

54 Outside edge,

55, 56 Separating structure, perforation

57 Groove

58 Hinged structure, slotted punch-out

61 Outside section

62 Adhesive surface

63 Outside edge

65 Outside section

66 Adhesive surface

67 Outside edge

71-74 Lengthwise edges; grooves

75-78 Side edges, long; grooves

81-84 Side edges, short; grooves

91 Connecting bridge for sections (61) and (65)

92 Outside edge to (91)

93 Separating structure, perforation to (91)